

## REMARKS

### Claim Status

Claims 1 and 4 are amended. Claim 8 is cancelled. Claims 9 to 17 are withdrawn from consideration. Claims 1 to 7 are now under examination in this application. Support for the amendments is found in the existing claims and the specification as discussed below.

Claim 1 has been amended to combine the subject matter of former claim 1 with the subject matter of former claim 8 and with part of the description on page 3 lines 20-27 (drying step), and page 9 line 27 (deep tissue samples).

Claim 4 has been amended to clarify said claim.

Applicants respectfully submit that the amendments to the claims do not introduce any new subject matter into the application, and that above amendments resolve any unclear matters.

### 35 U.S.C. § 112, paragraph 6

Claim 1 has been amended to recite “means for abrasive sampling” in conformance with 35 U.S.C. § 112, 6<sup>th</sup> paragraph. Furthermore the abrasive means “silica, glass, metals, carbon fibers and plastics” as recited in the specification (page 4, lines 19-20) have been incorporated into claim 1.

### Rejection under 35 U.S.C. § 102 (Volossiouk)

Claims 1-2 and 6-8 are rejected under 35 U.S.C. § 102(b) as being anticipated by Volossiouk et al. (Applied and Environmental Microbiology, 1995, 61, 3972-3976).

Applicants have amended the claims to clarify that the sampling involves removing deep tissue from plants using specific means for abrasive sampling and that said samples are further dried.

Volossiouk, et al. describe the direct DNA extraction for PCR mediated assays of soil organisms.

Volossiouk, et al. teach disruption of cells by grinding in liquid nitrogen with a mortar and pestle with additional abrasion provided by the soil. In contrast, Applicants employ a specific “sampling device comprising means for abrasive sampling [which is] a solid material selected from the group consisting of silica, glass, metals, carbon fibers and plastics”. Volossiouk, et al. do not teach a sampling device and do not teach the abrasive material as set forth in Applicants’ claim 1.

Furthermore, Volossiouk, et al. teach DNA extraction from soil samples, not from materials of plant origin as set forth in amended claim 1. Although Volossiouk, et al. teach that “previous experience had indicated that grinding in liquid nitrogen was entirely sufficient to disrupt both plant and fungal tissues” (page 3973, col. 2, first full paragraph), the described method is not directed to deep tissue as claimed by Applicants, but rather to grinding up the entire sample which may include plants without use of a sampling device having means for abrasive sampling.

Volossiouk, et al. further differs from the claimed invention in that there is no disclosure of “drying the samples retained on the means for abrasive sampling” as recited in claim 1 as amended. The ground sample of Volossiouk, et al. is immediately suspended in a milk powder solution as shown in Figure 1 and described on page 3973, col. 1, lines 1-3.

Applicant respectfully submits that Volossiouk et al. do not teach sampling of deep tissue samples from plant using abrasive means and drying the samples on the means for abrasive sampling as presently claimed.

In view of Applicants’ amendments and arguments, reconsideration and withdrawal of the above ground of rejection is respectfully requested.

**Rejection under 35 U.S.C. § 102 (Fenrich)**

Claims 1-4 and 6 are rejected under 35 U.S.C. § 102(e) as allegedly being anticipated by Fenrich et al. (US 2004/1219537).

Fenrich et al. disclose non-invasive epidermal collection methods and kits. Fenrich et al. is completely silent on a method of assaying nucleic acids by molecular hybridization, which comprises taking deep tissue samples of biological material of plant origin using means for abrasive sampling as presently claimed. Applicant respectfully submits that the present claims are novel in view of Fenrich et al.

Fenrich, et al. is directed to abrading surface cells as indicated in Paragraph 0059 of US 2004/0219537 which is reproduced below:

FIG. 1 shows a side view of a skin cell scraping and collection device 10 made of a suitable material such as polymer (e.g., polystyrene), metal, glass or ceramics. The device 10 has a collection and scraping surface 12 made of a polymer and having one or more slanted knife edge projections 14 having a height "B" and an end wall 16 having a height "A" and an appropriate degree of sharpness. The dimensions are selected such that they work to abrade and/or scrape off cells but not draw blood. For example, if the knife-edge projections are sufficiently sharp to cut through (slice) skin, then the height "B" is selected such that the device cannot penetrate the epidermis so far that it draws blood, e.g. about 10 to 100  $\mu\text{m}$ . For example, the height "B" could be sufficient such that the blade could penetrate the stratum corneum without substantially damaging underlying layers. If the edge sharpness is sufficient to abrade the epidermis but not cut through the epidermis then the height "B" can be in the range from about 10  $\mu\text{m}$  to about 1 centimeter, or typically about 100  $\mu\text{m}$  to about 5 millimeters. End wall height "A" would be any practical dimension. Typical heights "B" range from about 10  $\mu\text{m}$  to 5 mm.

In contrast, Applicants' claimed invention is directed to "taking deep tissue samples" (claim 1) as discussed in the present specification at Example 3 referring to Figure 4.

Applicants' claimed invention further differs from the disclosure of Fenrich, et al. in that the claims are directed to "samples of biological material of plant origin" while Fenrich, et al. is directed to epidermal collection (see Title, Abstract, for example).

In view of Applicants' amendments and arguments, reconsideration and withdrawal of the above ground of rejection is respectfully requested.

**Rejection under 35 U.S.C. § 103(a)**

Claims 1 and 3-5 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Volossiouk et al. and in view of Fenrich et al.

Applicant respectfully submits that there are no teachings in Volossiouk et al. which when combined with Fenrich et al. would lead one of ordinary skill in the art to the present invention.

Volossiouk et al. disclose the testing of soil samples. The soil samples are ground in liquid nitrogen using the natural abrasives in soil and treated with skimmed milk to avoid degradation. This document does not disclose a method of sampling deep tissue sample from plant using abrasive means as presently claimed. Therefore, Volossiouk et al. are completely silent on method as presently claimed.

Fenrich et al. does not correct the deficiencies of Volossiouk, et al. Fenrich, et al. disclose an epidermal collection method and kits. There is no teaching in this document concerning a method as presently claimed wherein deep tissue from plant is obtained using abrasive means. Applicants also respectfully submit that Fenrich et al. teaches away from the present invention by reciting a method for epidermal collection which is non-invasive, which is in contrast with the present invention wherein deep tissue sampling is required. Accordingly, the cited references, taken as a whole, do not teach or suggest all of the elements of the claimed invention.

The inventors have demonstrated that with the help of the abrading means, deep tissues from the plant are removed allowing the intimate binding of the sample to the abrasive means. This effect provides a faster drying step, and thereby avoids the oxidation risks (leading to a poor PCR). The present invention allows access to sub-cortical tissue of the plant and thereby avoids inhibition of hybridization due to phenolic compounds. In addition, upon the preparation of the DNA assay, the solid support wherein the sample is fixed is partially freed as individual particles in the buffer which provides a better grinding of the sample and the optimized release of the DNA to be analyzed. The sensibility of the method is thereby improved.

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Accordingly, the invention as presently claimed could not have been foreseen based on the teaching of Volossiuk et al. or Fenrich et al. either taken alone or combined.

It is the Applicant's opinion that there is no incentive to combine or adapt the teaching of the above cited documents and that the combined teaching of said documents would not lead to the invention as presently claimed. Reconsideration and withdrawal of the above ground of rejection is respectfully requested.

#### **No Disclaimers or Disavowals**

Although the present communication may include alterations to the application or claims, or characterizations of claim scope or referenced art, the Applicants are not conceding in this application that previously pending claims are not patentable over the cited references. Rather, any alterations or characterizations are being made to facilitate expeditious prosecution of this application. The Applicants reserve the right to pursue at a later date any previously pending or other broader or narrower claims that capture any subject matter supported by the present disclosure, including subject matter found to be specifically disclaimed herein or by any prior prosecution. Accordingly, reviewers of this or any parent, child or related prosecution history shall not reasonably infer that the Applicants have made any disclaimers or disavowals of any subject matter supported by the present application.

#### **CONCLUSION**

In view of Applicants' amendments to the claims and the foregoing Remarks, it is respectfully submitted that the present application is in condition for allowance. Should the Examiner have any remaining concerns which might prevent the prompt allowance of the application, the Examiner is respectfully invited to contact the undersigned at the telephone number appearing below.

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Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

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By: Che S. Chereskin  
Che Swyden Chereskin, Ph.D.  
Registration No. 41,466  
Agent of Record  
Customer No. 20,995  
(949) 721-6385

4847915  
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